What is claimed is:

1. A MOSFET simulation apparatus comprising:

an output unit; and

a processor which simulates an operation of MOSFET using a new MOSFET model, and outputs the simulation result to said output unit,

wherein said new MOSFET model comprises:

a MOSFET model known as BSIM3V3 and having a gate, a source, a drain and a gate insulating film;

a first circuit model connected between said gate and said source, and including first and second diode models connected in parallel in opposite directions to each other; and

a second circuit model connected between said gate and said drain, and including third and fourth diode models connected in parallel in opposite directions to each other.

2. The MOSFET simulation apparatus according to claim 1, wherein said gate insulating film is equal to or thinner than 2 nm.

3. The MOSFET simulation apparatus according to claim 1, wherein each of said first to fourth diode models does not depend on temperature.

4. The MOSFET simulation apparatus according to

claim 3, wherein each of said first to fourth diode models includes a series connection of a resistance model and a voltage controlled current source without a capacitance model.

5. The MOSFET simulation apparatus according to claim 4, wherein said voltage controlled current source is expressed by

$$i = Is\left[\exp\left(\frac{V}{N_{FT}}\right)-1\right]$$

where i is current, N_{FT} is a bias-dependence parameter of tunnel current, V is a voltage applied to said voltage controlled current source, and Is is source current.

6. The MOSFET simulation apparatus according to claim 1, wherein said first diode model has an anode connected to said gate and a cathode connected to said source and said third diode models has an anode connected to said gate and a cathode connected to said drain, and said first and third diode models are used when a voltage of said gate is higher than voltages of said source and said drain, respectively.

7. The MOSFET simulation apparatus according to claim 6, wherein each of said first and third diode models has an area equal to a half of an area of said

gate.

8. The MOSFET simulation apparatus according to claim 1, wherein said second diode model has an anode connected to said source and a cathode connected to said gate and said fourth diode models has an anode connected to said drain and a cathode connected to said gate, and said second and fourth diode models are used when a voltage of said gate is lower than voltages of said source and said drain, respectively.

9. The MOSFET simulation apparatus according to claim 8, wherein said second diode model has an area equal to an overlapping area of said gate and said source, and said fourth diode model has an area equal to an overlapping area of said gate and said drain.

10. A recording medium in which a program is recorded for a MOSFET simulation method using a new MOSFET model, wherein said new MOSFET model comprises:

a MOSFET model known as BSIM3V3 and having a gate, a source, a drain and a gate insulating film;

a first circuit model connected between said gate and said source, and including first and second diode models connected in parallel in opposite directions to each other; and

a second circuit model connected between said

gate and said drain, and including third and fourth diode models connected in parallel in opposite directions to each other.

11. The recording medium according to claim 10, wherein said gate insulating film is equal to or thinner than 2 nm.

12. The recording medium according to claim 10, wherein each of said first to fourth diode models does not depend on temperature.

13. The recording medium according to claim 12, wherein each of said first to fourth diode models includes a series connection of a resistance model and a voltage controlled current source without a capacitance model.

14. The recording medium according to claim 13, wherein said voltage controlled current source is expressed by

$$i = Is\left[\exp\left(\frac{V}{N_{FT}}\right)-1\right]$$

where i is current, N_{FT} is a bias-dependent parameter of tunnel current, V is a voltage applied to said voltage controlled current source, and Is is source current.

15. The recording medium according to claim 10, wherein said first diode model has an anode connected to said gate and a cathode connected to said source and said third diode models has an anode connected to said gate and a cathode connected to said drain, and said first and third diode models are used when a voltage of said gate is higher than voltages of said source and said drain, respectively.

16. The recording medium according to claim 15, wherein each of said first and third diode models has an area equal to a half of an area of said gate.

17. The recording medium according to claim 10, wherein said second diode model has an anode connected to said source and a cathode connected to said gate and said fourth diode models has an anode connected to said drain and a cathode connected to said gate, and said second and fourth diode models are used when a voltage of said gate is lower than voltages of said source and said drain, respectively.

18. The recording medium according to claim 17, wherein said second diode model has an area equal to an overlapping area of said gate and said source, and said fourth diode model has an area equal to an overlapping area of said gate and said drain.

19. A MOSFET simulation method using a new MOSFET model, comprising:

when a voltage of a gate of a MOSFET model known as BSIM3V3 is higher than voltages of a source and drain, respectively, simulating a gate insulating film tunnel current using a first model having no temperature dependency provided between said gate and a source and a second model having no temperature dependency provided between said gate and a drain; and

when the voltage of said gate is lower than the voltages of said source and drain, respectively, simulating said gate insulating film tunnel current using a third model having no temperature dependency provided between said gate and said source and a fourth model having no temperature dependency provided between said gate and said drain.

20. A MOSFET simulation method using a new MOSFET model, comprising:

when a voltage of a gate of a MOSFET model known as BSIM3V3 is higher than voltages of a source and drain, respectively, simulating a gate insulating film tunnel current using a first model having bias dependency provided between said gate and a source and a second model having bias dependency provided between said gate and a drain; and

when the voltage of said gate is lower than

the voltages of said source and drain, respectively, simulating said gate insulating film tunnel current using a third model having bias dependency provided between said gate and said source and a fourth model having bias dependency provided between said gate and said drain.